REMARKS

In the Office Action mailed March 18, 2008 (hereinafter "Office Action"), Claims 1, 3, 8, 10, 15, and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones et al., "TASK Forces: Distributed Software for Solving Problems of Substantial Size," *Proceedings of the 4th International Conference on Software Engineering*, September 1979 (hereinafter "Jones"). Claims 2, 7, 9, 14, 16, and 21 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones in view of applicants' admitted prior art. Claims 4-6, 11-13, and 18-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones in view of U.S. Patent No. 6,934,755, issued to Saulpaugh et al. (hereinafter "Saulpaugh").

While applicants respectfully disagree with the foregoing rejections, in order to advance the prosecution of this application, Claims 1, 7, 8, and 15 have been amended. Claims 1-21 remain pending in the application.

Pursuant to 37 C.F.R. § 1.111 and for the reasons set forth below, applicants respectfully traverse the rejections and request reconsideration and allowance of the pending claims. Prior to discussing the reasons why applicants believe that the pending claims are in condition for allowance, a brief description of the disclosed subject matter and the cited patents and publications are presented. It should be appreciated, however, that the following descriptions are provided to assist the Examiner in appreciating the differences between the claimed subject matter and the cited patents and publications, and should not be construed as limitations on the disclosed subject matter.

Brief Descriptions

Disclosed Subject Matter

A system and method for cooperative automated execution of distributed tasks by a set of computers without a centralized controller are disclosed. Execution of a sequence of tasks is

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coordinated through the cooperation of peer computers in a network environment. A software execution agent running on each of the peer computers coordinates cooperative execution of the tasks relative to other computers in the set of networked peer computers. Task execution instructions including the sequence of the tasks to be executed and an automatically, without user action, determined assignment of the peer computers that are to perform the individual tasks are transmitted to a first computer in the set of peer computers. The first computer forwards execution instruction information derived from the execution instructions to the other peer computers. Each of the peer computers transmits and receives peer-to-peer communication messages to and from each of the other peer computers to synchronize and coordinate the execution of the sequence of tasks.

Jones ("TASK Forces")

Jones, according to its abstract, purportedly discloses a high level specification language for defining software that executes on distributed computers, and specifically describes a system for distributed image processing. A programmer specifies the interrelated components of a "task force," and a user adapts the configuration of the task force by specifying processes to be replicated, partitioning data into multiple memory units, and controlling physical resource allocations. In the described image processing system, a user partitions an image into separate slices. Each "server process" that filters a user-specified slice communicates with a Manager process (which is responsible for coordinating Server actions) and only those server processes that manipulate a contiguous slice through the use of shared objects. See Jones, p. 318, Col. 1, paragraph 1.

Jones fails to teach or suggest an automatically, without user action, determined assignment of tasks to peer computers, as the assignment of server actions to servers in Jones requires the input of a programmer or a user. Jones also fails to teach receiving, by a first

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computer from each of the other peer computers, and transmitting, by the first computer to each of the other peer computers, peer-to-peer communication messages to synchronize and coordinate the execution of a sequence of tasks, because Jones instead requires a Manager process to coordinate Server actions.

Saulpaugh (U.S. Pat. No. 6,934,755)

Saulpaugh, according to its abstract, purportedly discloses a method and a system for migrating applications from one virtual machine to another virtual machine on a network. Saulpaugh purportedly discloses Java language related technologies migrating an application from one machine to another on a network, including the internal and external states of the application as included in a persistent memory heap. The persistent memory heap may include code and data structures for use in the application. Applications running on one Java virtual machine (JVM) may be migrated to another JVM on another machine across the network by transmitting the application code as well as the persistent heap.

As Saulpaugh relates to migrating Java applications between virtual machines, Saulpaugh fails to teach or describe an automatically, without user action, determined assignment of tasks to peer computers. Saulpaugh also fails to teach receiving, by a first computer from each of the other peer computers, and transmitting, by the first computer to each of the other peer computers, peer-to-peer communication messages to synchronize and coordinate the execution of a sequence of tasks

Patentability of Independent Claims 1, 8, and 15

The Office Action rejected independent Claims 1, 8, and 15 under 35 U.S.C. § 103(a) as unpatentable over Jones. Applicants respectfully traverse these rejections.

As amended, Claim 1 reads:

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1. A computer-readable medium having computer-executable instructions stored thereon for performing steps for coordinated execution of distributed tasks, the steps comprising:

receiving, by a first computer in a group of peer computers, each of the peer computers having at least one processing unit and one input device and one output device distinct from the at least one processing unit, a set of execution instructions for the peer computers, the execution instructions including a sequence of tasks to be performed and *an automatically, without user action, determined assignment of the tasks to the peer computers*;

forwarding, by the first computer to the other peer computers in the group, execution instruction information derived from the execution instructions such that each peer computer in the group is informed of tasks assigned thereto in relation to tasks assigned to the other peer computers;

executing, by the first computer, tasks assigned thereto in connection with execution of tasks assigned to the other peer computers in the group; and

receiving, by the first computer from each of the other peer computers, and transmitting, by the first computer to each of the other peer computers, peer-to-peer communication messages containing task execution status to synchronize and coordinate the execution of the sequence of tasks. (Emphasis added.)

As amended, Claim 8 reads:

8. A method of performing coordinated execution of distributed tasks by a group of peer computers, comprising:

receiving, by a first computer in the group of peer computers, each of the peer computers having at least one processing unit and one input device and one output device distinct from the at least one processing unit, a set of execution instructions for the peer computers, the execution instructions including a sequence of tasks to be performed and *an automatically, without user action, determined assignment of the tasks to the peer computers*;

forwarding, by the first computer to the other peer computers in the group, execution instruction information derived from the execution instructions such that each peer computer in the group is informed of tasks assigned thereto in relation to tasks assigned to the other peer computers;

executing, by the first computer, tasks assigned thereto in connection with execution of tasks assigned to the other peer computers in the group; and

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receiving, by the first computer from each of the other peer computers, and transmitting, by the first computer to each of the other peer computers, peer-to-peer communication messages containing task execution status to synchronize and coordinate the execution of the sequence of tasks. (Emphasis added.)

As amended, Claim 15 reads:

15. A computer system for performing automated execution of distributed tasks, comprising:

a plurality of peer computers connected by a network, each of the peer computers having:

at least one processing unit;

at least one input device distinct from the at least one processing unit;

at least one output device distinct from the at least one processing unit; and

an execution agent, the execution agent of each peer computer being programmed for:

receiving a set of execution instructions for the peer computers, the execution instructions including a sequence of tasks to be performed and *an automatically, without user action, determined assignment of the tasks to the peer computers*;

forwarding to the execution agents on the other peer computers execution instruction information derived from the execution instructions such that each peer computer in the group is informed of tasks assigned thereto in relation to tasks assigned to the other peer computers;

executing tasks assigned to said each peer computer in connection with execution of tasks assigned to the other peer computers; and

receiving from each of the other peer computers and transmitting to each of the other peer computers peer-to-peer communication messages containing task execution status to synchronize and coordinate the execution of the sequence of tasks. (Emphasis added.)

Applicants respectfully submit that Jones fails to teach or suggest the combination of features recited in these claims, including *an automatically, without user action, determined assignment of tasks to peer computers* as recited in amended Claims 1, 8, and 15; *receiving, by the first computer from each of the other peer computers, and transmitting, by the first computer*

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to each of the other peer computers, peer-to-peer communication messages to synchronize and coordinate the execution of a sequence of tasks as recited in amended Claims 1 and 8; and *receiving from each of the other peer computers and transmitting to each of the other peer computers peer-to-peer communication messages* to synchronize and coordinate the execution of a sequence of tasks as recited in amended Claim 15.

Jones fails to teach or suggest an *automatically, without user action, determined* assignment of tasks to peer computers because the system described in Jones requires user input for the partitioning of a problem into tasks. As described at page 318, Col. 1, paragraph 1, and later at page 325, Col. 1, paragraph 2, a *user* partitions an image into separate slices. Indeed, Jones is premised on the fact that at some point in the development of a task force, the programmer must be aware of the distributed execution environment. *See* page 322, Col. 2, paragraph 3. The assignment of tasks therefore would not be automatically determined without user action because it would require programmer awareness of the distributed execution environment.

Jones further fails to teach or suggest *receiving, by the first computer from each of the other peer computers, and transmitting, by the first computer to each of the other peer computers, peer-to-peer communication messages* to synchronize and coordinate the execution of a sequence of tasks as recited in amended Claims 1 and 8, or *receiving from each of the other peer computers and transmitting to each of the other peer computers peer-to-peer communication messages* to synchronize and coordinate the execution of a sequence of tasks as recited in amended Claim 15, because the sequence of tasks in Jones is coordinated not by peer-to-peer communication messages, but is instead coordinated by a Manager process. *See* page 318, Col. 1, paragraph 1; page 326, Col. 1, paragraph 2 ("Despite their independence the

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server processes have to cooperate to achieve a common goal, namely to process the entire image. *The Manager coordinates server actions.*" (emphasis added)).

Even when the server processes of Jones do communicate with each other, they do not communicate with each of the other peer computers as recited in the amended claims, but instead only with those server processes that manipulate a contiguous slice or with the Manager. *See* page 318, Col. 1, paragraph 1. Further, the server processes do not communicate by transmitting or receiving peer-to-peer communication *messages* as recited in the amended claims, but instead communicate through the use of *shared objects*. *See* page 317, Cols. 1-2, last paragraph of Col. 1 ("Messages *or* shared data structures are used to communicate control information between the two processes. In TASK, we base communication on *shared objects*, because our target computer is a multiprocessor." (Emphasis added.)). To the extent that the Office Action stated that the use of messages to coordinate execution is inherent, applicants respectfully disagree, as the passage quoted above shows that Jones explicitly does not use messages to coordinate execution.

For at least these reasons, Jones fails to teach or suggest the combination of features recited in amended Claims 1, 8, and 15. Accordingly, applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejections with respect to Claims 1, 8, and 15, and allowance of the claims.

Patentability of Dependent Claims 2-7, 9-14, and 16-21

Claims 2-7 depend from Claim 1. Claims 9-14 depend from Claim 15. Claims 16-21 depend from Claim 15. Since neither applicants' allegedly admitted prior art and/or Saulpaugh make up for the deficiencies of Jones, applicants respectfully submit that these claims are allowable at least by virtue of these dependencies, as well as by virtue of the additional claim

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features set forth therein. Accordingly, applicants also respectfully request withdrawal of the 35 U.S.C. § 103(a) rejections and allowance of these claims.

CONCLUSION

In view of the foregoing amendments and remarks, applicants submit that the pending claims are in condition for allowance over the cited and applied patents and publications, and respectfully request reconsideration and allowance of the same. If the Examiner has any questions or comments concerning this matter, the Examiner is invited to contact the undersigned at the number set forth below.

Respectfully submitted,

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